

IEEE Transactions on Medical Imaging

Special Issue on **Geometric Deep Learning in Medical Imaging**

Unlike convolutional neural networks (CNNs) that are inherently limited to 2D/3D grid-structured data, geometric deep learning (GDL) is capable of handling non-Euclidean data (i.e., graphs and manifolds) and is hence well-suited for medical imaging data, structure-function connectivity networks, imaging genetics and omics data, and spatiotemporal anatomical representations. However, despite recent advances in GDL research, questions remain on how best to learn representations of non-Euclidean data; how to convolve effectively on graphs; how to perform graph pooling/unpooling; how to handle heterogeneous data; and how to improve the interpretability of GDL.

This special issue focuses on state-of-the-art GDL techniques and their applications in medical imaging. We seek contributions that include, but are not limited to:

- Theoretical underpinnings of GDL problems arising in medical imaging
- Novel applications of GDL in medical imaging acquisition, reconstruction, and analysis
- Un/semi/weakly-supervised learning for GDL; Annotation efficient approaches to GDL
- Domain adaptation, transfer learning and adversarial learning in medical imaging with GDL
- Multi-modal medical imaging data fusion and integration with GDL
- Joint latent space learning with GDL for medical imaging and non-imaging data integration
- Spatiotemporal medical imaging and image analysis using GDL
- GDL approaches for medical image registration, super-resolution, and resampling
- Accelerated medical imaging acquisition/reconstruction with non-Cartesian sampling using GDL
- Graph network models (GNN) for medical imaging and medical image computing
- Novel datasets, challenges, and benchmarks for application and evaluation of GDL

Authors must submit papers on [ScholarOne](#) according to the instruction [here](#). **Please choose “Special Issue on Geometric Deep Learning in Medical Imaging” as the *manuscript type* in the submission process.** Four reviewers will be typically recruited according to the standard TMI review protocol. Authors are encouraged to discuss with one of the guest editors to determine suitability for this special issue.

Guest Editors:

Huazhu Fu, Institute of High Performance Computing, A*STAR, Singapore.
hzfu@ieee.org

Yitian Zhao, Ningbo Institute of Materials Technology and Engineering, CAS, China.
yitian.zhao@nimte.ac.cn

Pew-Thian Yap, University of North Carolina at Chapel Hill, USA.
ptyap@med.unc.edu

Carola-Bibiane Schönlieb, DAMTP, University of Cambridge, UK.
cbs31@cam.ac.uk

Alejandro F. Frangi, University of Leeds, UK, and KU Leuven, Belgium.
a.frangi@leeds.ac.uk

Key Dates:

Deadline for Submission:	15th Jan. 2022	1st Mar. 2022
First Reviews Due:	15th Mar. 2022	1 st May 2022
Revised Manuscript Due:	15th Jun. 2022	1 st Aug. 2022
Final Decision:	15th Aug. 2022	1 st Oct. 2022